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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050				
EXAMINER MOORE, KARLA A				
ART UNIT		PAPER NUMBER		
1763				

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/059,572

Applicant(s)

STEVENS ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19,20,22-25,27,32-36,38-40 and 96-104 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 98 and 99 is/are allowed.
- 6) ☒ Claim(s) 19,20,22-25,27,32-36,38-40,96,97 and 100-104 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0604.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 19-20 and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 4,021,278 to Hood et al.

3. Hood et al. disclose a substrate processing apparatus, comprising: a fluid impermeable evaporation shield (Figure 1, 10) adapted to be positioned over a substrate (1) on a substrate support (3), the fluid impermeable evaporation shield having a fluid retaining surface adapted to form a gap (11) with respect to the substrate wherein the thickness of the gap is between about 0.5mm and about 4mm (column 2, rows 23-28).

4. With respect to claim 20, the shield is sized have an outer diameter that is greater than or equal to an outer diameter of the substrate (see Figures 1 and 3-4).

5. With respect to claim 22, the gap is adapted to be filled with a fluid layer (column 2, rows 36-44).

6. With respect to claim 23, the evaporation shield may further comprise at least one port to deliver fluid (15a/16a; column 7, rows 43-46) to form a fluid to form the fluid layer.

7. Claims 19-20, 22-25, 38-39, 101 and 103 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 4,544,446 to Cady.

8. Cady discloses a substrate processing apparatus, comprising: a fluid impermeable evaporation shield (Figure 1, 12) adapted to be positioned over a substrate (14) on a substrate support (32), the fluid impermeable evaporation shield having a fluid retaining surface adapted to form a gap (30) with respect

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to the substrate wherein the thickness of the gap is between about 0.5 mm and about 4 mm (column 8, rows 65-67 and column 12, rows 37-38).

9. With respect to claim 20, the shield is sized have an outer diameter that is greater than or equal to an outer diameter of the substrate (see Figure 1; column 12, rows 26-31).

10. With respect to claim 22, the gap is adapted to be filled with a fluid layer (column 5, rows 36-44).

11. With respect to claim 23-25, the evaporation shield may further comprise at least one port to deliver fluid (24) to form a fluid to form the fluid layer and at least one port (Figures 16A and B, 210 and 212; column 11, rows 62-68).

12. With respect to claim 38, the evaporation shield may further comprise fluid agitation components, selected from the group consisting of channels, veins and protrusions (column 4, row 64 through column 5, row 2 and column 9, rows 18-30), the fluid agitation components being disposed on a bottom surface of the evaporation shield.

13. With respect to claim 39, the evaporation shield may be comprised of a polymer or comprise a material selected from the group consisting of polymers, ceramics, quartz and coated metals (column 8, rows 20-21).

14. With respect to claim 101, the evaporation shield is adapted to rotate (column 7, rows 40-44).

15. With respect to claim 103, the evaporation shield is adapted to be vertically movable (column 7, rows 31-36).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cady as applied to claims 19-20, 22-25, 38-39, 101 and 103 in view of German Patent No. 29922090U1 to Sotralentz.

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17. Cady discloses the invention substantially as claimed and as described above. Additionally, Cady provides motivation for providing degassing means in the invention (column 11, rows 35-68).
18. However, Cady fails to teach the evaporation shield specifically comprising a degassing membrane.
19. Sotralentz teaches the use of a degassing membrane provided in a container top (Figures 1-2 and abstract) for the purpose of provide a container capable of simple and effective degassing.
20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a degassing membrane in Cady in order to provide a container capable of simple and effective degassing as taught by Sotralentz.
21. Claims 32-33 and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,544,446 to Cady in view of U.S. Patent No. 4,120,699 to Kennedy, Jr. et al.
22. Cady discloses a substrate processing apparatus substantially as claimed in Figure 1 and comprising: an evaporation shield (12) having an outer diameter that is greater than or equal to an outer diameter of a substrate positioned on a substrate support member (16), the evaporation shield having a substantially planar lower surface adapted to form a gap (30) with respect to the substrate, wherein the gap is adapted to be filled with a fluid layer.
23. However, Cady fails to teach a transducer coupled to/disposed against the evaporation shield to provide acoustic waves to the fluid layer.
24. Kennedy, Jr. et al. teach the use of a plurality of transducers (Figure 3, 26, 28 and 30) spaced about the walls of a chamber (including the top) for the purpose of causing acoustic waves with constructive interference that sweeps over a substrate to be processed and results in needing a shorter period of time for cleaning a substrate with an irregular surface (column 4, rows 4-32).
25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transducer coupled to an evaporation shield in Cady in order to cause acoustic waves with constructive interference that sweep over a substrate to be processed and result in

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the need for a shorter period of time to clean a substrate with an irregular surface as taught by Kennedy, Jr. et al.

26. With respect to claim 104, the evaporation shield of Cady is adapted to be vertically movable (column 7, rows 31-36).

27. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cady and Kennedy, Jr. et al. as applied to claims 32 and 33 above, and further in view of U.S. Patent No. 6,224,713 to Hembree et al.

28. Cady and Kennedy, Jr. et al. disclose the invention substantially as claimed and as described above.

29. However, Cady and Kennedy, Jr. et al. fail to disclose the transducer comprising a rod which is adapted to contact a fluid layer.

30. Hembree et al. teach mounting a transducer (Figure 5, 28) on a submersible rod (34) to transmit energy from the transducer to a processing solution for the purpose of preventing the need to bring the transducer in direct contact with the solution (column 5, rows 49-53).

31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a submersible rod for mounting a transducer in Cady and Kennedy, Jr. et al. in order to prevent the need for bringing the transducer in direct contact with a processing solution as taught by Hembree et al.

32. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hood et al. as applied to claims 19-20 and 22-23 above, in view of U.S. Patent No. 5,853,961 to Sakai et al.

33. Hood et al. disclose the invention substantially as claimed and as described above.

34. However, Hood et al. fail to teach the evaporation shield comprises a seal adapted to contact the substrate support or that the substrate supports comprises a seal adapted to contact the evaporation shield.

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35. Sakai et al. teach the use of a sealing O-ring (Figure 10; column 46, rows 45-47) for the purpose of sealing gaps between a shield/cover (40g) and a substrate support (40h) to prevent outward leakage of a treatment liquid.

36. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a seal adapted to contact the substrate support or a substrate support comprising a seal adapted to contact the evaporation shield in Hood et al. in order to prevent seal a treatment gap and prevent the outflow of a treatment liquids as taught by Sakai et al.

37. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cady as applied to claims 19-20, 22-25, 38-39, 101 and 103 in view of German Patent No. 29922090U1 to Sotralentz.

38. Cady discloses the invention substantially as claimed and as described above.

39. However, Cady fails to specifically teach the evaporation shield comprises a polymer material.

40. Cady, however, does teach the use of non-reactive construction materials such as Teflon (PTFE) for the purpose of protection against reactive chemicals (column 9, rows 43-45).

41. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have constructed other parts of the apparatus that come into contact with reactive materials, such as the shield, comprising a polymer material such as PTFE in Cady in order to protect against reactive chemicals as suggested elsewhere in Cady.

42. Claims 96-97 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,544,446 to Cady in view of German Patent No. 29922090U1 to Sotralentz.

43. Cady discloses a substrate processing apparatus substantially as claimed in Figure 1 and comprising: an movable evaporation shield (12) adapted to be positioned over a substrate (14) contacting a substrate support (16).

44. However, Cady fails to teach the evaporation shield comprising a degassing membrane and a plenum in communication with the degassing membrane or a plenum port coupled to the plenum.

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45. Sotralentz teaches the use of a degassing membrane provided in a container top (6, Figures 1-2 and abstract) for the purpose of provide a container capable of simple and effective degassing. The device further comprises a plenum (area between 6 and 7) and plenum port (8) coupled to the plenum.

46. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a degassing membrane, plenum and plenum port in Cady et al. in order to provide a container capable of simple and effective degassing as taught by Sotralentz.

47. With respect to claim 102, the evaporation shield of Cady is adapted to be vertically movable (column 7, rows 31-36).

48. Claims 100 is rejected under 35 U.S.C. 103(a) as being unpatentable Cady as applied to claims 19-20, 22-25, 38-39, 101 and 103 above, in view of U.S. Patent No. 4,821,675 to Ikeno et al.

49. Cady discloses the invention substantially as claimed and as described above.

50. However, Cady fails to teach the evaporation shield is adapted to provide heat to the fluid layer.

51. Ikeno et al. teach the use of an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus for the purpose of restraining temperature variation of the fluid (column 2, rows 40-43 and column 2, rows 65-column 3, row 2).

52. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus in Cady in order to restrain temperature variation of the fluid as taught by Ikeno et al.

Allowable Subject Matter

53. Claims 98 and 99 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or fairly suggest a vacuum/low partial pressure source coupled to the plenum port of the apparatus. Nor does any other piece of art provide motivation for combination of this feature with the prior art of record.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

54. Applicant's arguments with respect to use of Kunisawa et al. and the supplementary references used in the previous office action in combination with the newly recited and/or amended features of independent claims 19, 32 and 96 have been fully considered and are persuasive. Therefore, the rejections has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cady and Hood et al. Hood et al. and Cady each disclose a fluid impermeable evaporation shield and/or an evaporation shield having an outer diameter that is greater than or equal to an outer diameter of a substrate positioned on a support and/or a movable evaporation shield.

Conclusion

55. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

56. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

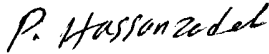
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571.272.1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Karl Moore
30 August 2004


Parviz Hassanzadeh
Primary Examiner
Art Unit 1763